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XLIV.—*Evidence of an Extinct Eel* (*Urenchelys anglicus*, *sp. n.*) *from the English Chalk.* By A. SMITH WOODWARD, F.L.S.

[Plate IX. figs. 1, 1 a.]

THIRTEEN years ago the late Mr. James W. Davis described some imperfect fishes from the Upper Cretaceous of Mount Lebanon which he supposed to represent two extinct species of eels named respectively *Anguilla sahel-almæ* and *A. hakelensis*, in allusion to the localities where the specimens were found*. In 1897 Mr. Raymond Storms pointed out † that the first of these species could not be an Apodal fish of any kind, while the second was so imperfectly described and figured that Davis's generic determination at least was not justified. Quite lately an examination of the original specimens in the British Museum has determined their true relationships. It appears that the so-called *Anguilla sahel-almæ* is really an extinct member of the Notacanthidæ,

* J. W. Davis, "The Fossil Fishes of the Chalk of Mount Lebanon in Syria," Trans. Roy. Dublin Soc. [2] vol. iii. (1887), pp. 625, 626, pl. xx. figs. 2, 3.

† R. Storms, "Première Note sur les Poissons Wemmeliens (Eocène supérieur) de la Belgique," Bull. Soc. Belge Géol. vol. x. (1897), Mém. p. 239.

representing a hitherto unknown genus *Pronotacanthus**, while *Anguilla hakelensis* is an undoubted eel with blunt teeth and a differentiated small caudal fin, which will shortly be described under the generic name of *Urenchelys*†. Evidence of a second species of the latter from Sahel Alma will also be made known.

There is thus no doubt that the Apodal fishes date back to the Cretaceous period. The object of the present paper is to show that they occur even in the English Chalk. A well-preserved skull of a typical eel from the Lower Chalk of Clayton, Sussex, is to be recognized in the Willett Collection in the Brighton Museum. Thanks to the kindness of Edward Crane, Esq., F.G.S., I have had the privilege of studying this fossil and comparing it with the crushed remains from the Lebanon. It is shown of the natural size from both sides in Pl. IX. figs. 1, 1 a.

The cranium in this specimen is very narrow and elongated, and its bones are remarkably stout. The roof in the parietal and frontal regions rises into a sharp median longitudinal ridge, and the occipital border also seems to be raised. The supraoccipital is not preserved, but the anterior portion doubtless of the parietal bones (*pa.*) is produced forwards as a tapering point between the hinder ends of the frontals (*fr.*), of which considerable portions are destroyed. The squamosals are not seen, but there is a sharp postorbital prominence evidently formed by the cartilage-postfrontal or sphenotic (*sp.*). The precise shape and limits of the ethmoidal rostral region (*m.*) are uncertain, the specimen being crushed and imperfect. The mandibular suspensorium is well displayed on each side, the upper articulation of the expanded hyomandibular (*hm.*) extending as far forwards as the sphenotic. The articular end of the quadrate (*qu.*) for the support of the mandible is directly beneath the sphenotic. So far as they can be distinguished, the metapterygoid and entopterygoid appear to be delicate; but a bone which is probably the ectopterygoid (*ec.*) is stouter and may have borne teeth. A still larger and stouter external bone in the upper jaw is doubtless the

* Differing from recent genera in exhibiting dorsal fin-supports without either fin-rays or spines attached to them (Catal. Foss. Fishes B. M. pt. iv.).

† Teeth small, bluntly conical, in numerous series. Slender branchiostegal rays not curving round opercular apparatus. Vertebrae about 100, the hindmost bearing a pair of hypurals. Pectoral fins present; dorsal fin arising immediately behind occiput and extending to the small caudal fin, which is separate. Scales rudimentary. (Catal. Foss. Fishes B. M. pt. iv.)

maxilla (*mx.*); and this element on the left side of the fossil is displaced so as to expose the oral face, which is expanded, slightly concave, and marked with the bases of attachment of clustered small teeth. The premaxillæ (*pmx.*) seem to be fused into a continuous mass with the mesethmoid and vomer. The bone thus formed is expanded and obtusely rounded in front, while its oral face is covered with a dense cluster of small bluntly conical or hemispherical teeth. The mandible (*md.*) is deepest in the coronoid region and tapers towards the symphysis with a characteristic curvature. The oral face of the dentary bone is somewhat expanded and covered with a cluster of obtuse teeth resembling those of the rostrum but smaller. Attached to the hinder border of the mandibular suspensorium on the right side is the well-preserved preoperculum (*p.op.*). This is a rather stout bone, with thickened straight anterior margin and a small semicircular posterior expansion. The operculum (*op.*) is a very small bone, constricted just below its thickened suspensory articulation and slightly expanded distally. There are traces of vertebræ, but these are too imperfect for description.

The osteological characters of the head and opercular apparatus from Clayton now described seem to prove conclusively that the specimen belongs to a typical generalized eel. The only difficulty arises in connexion with its generic and specific determination. Its close resemblance, however, to the head of *Urenchelys*, as known from the Upper Cretaceous of Sahel Alma in the Lebanon, suggests that it may best be referred to this genus, while it differs from each of the known species not only in its much larger size, but also in the depth of the head compared with its length. The species from Sahel Alma has a relatively longer, that from Hakel a relatively shorter, head. The species from the English Chalk may therefore receive the provisional name of *Urenchelys anglicus*.

EXPLANATION OF PLATE IX. FIGS. 1, 1 a.

Fig. 1. *Urenchelys anglicus*, sp. n.; head with opercular apparatus, right and left (1 a) lateral aspects, nat. size.—Lower Chalk; Clayton, Sussex. [Willett Collection, Brighton Museum.]

ec., ectopterygoid; *fr.*, frontal; *hm.*, hyomandibular; *m.*, mesethmoid; *md.*, mandible; *mx.*, maxilla; *op.*, operculum; *p.op.*, preoperculum; *pa.*, parietal; *pmx.*, premaxilla; *qu.*, quadrate; *sp.*, sphenotic (postfrontal).